Redefining Schools as Learning Organizations: A Model for Trans-generational Teaching and Learning

Joette Stefl-Mabry and William E. J. Doane
University at Albany, State University of New York

Michael S. Radlick
Institute for Research on Learning Technology Visions

Pamela Theroux
University at Albany, State University of New York

Collaborative problem-based courses can engage university students and faculty in more authentic, powerful, and meaningful learning experiences. For the past five years, the College of Computing and Information's Department of Information Studies has been cultivating an educational partnership that brings together university students with their professional in-service counterparts in local K-12 school districts to explore issues of pedagogy, theory, curriculum, information literacy, technology, multimedia, and assessment. A capstone graduate course has evolved into a trans-generational learning collaboratory. The development and results of the course are discussed along with recommendations for others looking to engage in trans-generational pedagogy.

This paper describes the evolution of a trans-generational pedagogical model developed at the University at Albany, Statue University of New York, that erases traditional "learning" boundaries by gathering K-12 students, in-service teachers, school library media specialists, undergraduate students, graduate students, and university faculty together in the same learning space to design, implement, and assess real world curriculum as a learning team. Thus participants, as "students," "teachers," and "professionals" collectively create, design, deploy, implement, and assess authentic, standards-based multimedia applications and curricula. As Oberlander and Talbert-Johnson (2004) note, "It is vital that teacher preparation programs equip pre-service and in-service candidates with the requisite skills to design, analyze, synthesize and evaluate information while integrating instructional technology in support of learning" (p. 48).

In order to develop learners who are critical thinkers, Dewey (1915) advocated for the development of a model of schooling that embraced the social dimension of learning to promote flexible adaptation, which he deemed critical for human advancement in a democratic society. Social relationships, according to Dewey (1929), are critical, for the "mind" arises from the development of collective human activity and shared meanings. The development and enhancement of critical-thinking skills through collaborative learning, according to researchers such as Gokhale (1995), is considered one of the primary goals of technology education. Although social environments provide motivation for students to learn (Vygotsky, 1978), colleges of education have been slow in preparing teachers to use technology in teaching practice. *Educating School Teachers,* a report released in 2006 by the Education Schools Project, describes most U.S. college and university teacher-education programs as failing teachers, with outdated visions and embarrassingly low standards (Fogg, 2006).

New models of instruction are needed at all levels of education (K-12 through higher education) to enable learners to develop critical thinking skills that will facilitate their ability to communicate, collaborate, reflect, and compromise. Pre-service educators "still have the mindset of being consumers of education instead of producers of education" (Swain, 2006, p.56). Pre-service teachers and school library media specialists need to consider and create ways "to use educational technologies in different teaching and learning contexts…to enrich the learning and educational experience for all learners" (pp. 56-57). Segers and Docy (2001) recommend the development of "more powerful learning environments" (p. 328) in order to attain the goal of deep learning. Powerful learning environments are "characterized by the view that learning means actively constructing knowledge and skills on the basis of prior knowledge, embedded in authentic, contexts that offer ample opportunities for social interaction" (Segers & Docy, 2001, p. 328).

Collaborative Learning

Successful learners in the 21st century must respond to many diverse pressures "such as the drive to use more multimedia, the need for lifelong learning and the changing labour market" (Segers & Docy, 2001, p. 327). Technological advances and organizational infrastructure transformations have made collaborative teamwork within the labor force a necessity (Brown & Duguid, 2000; Gokhale, 1995). Gokhale (1995) describes collaborative learning as an instructional method in which students at various performance levels work together in small groups toward a common academic goal: "The students are responsible for one

another's learning as well as their own. Thus, the success of one student helps other students to be successful" (p. 2).

Proponents of collaborative learning claim that the exchange of ideas by groups of learners increases learner engagement, improves problem solving strategies, and promotes higher levels of thinking (Bruner, 1985; Johnson & Johnson, 1986; Totten, Sills, Digby, & Russ, 1991). Research has revealed that students who establish social relationships with teachers and other learners in the community are more actively engaged in learning, report greater personal and academic growth, and are more satisfied with their education than are students who are more isolated (Astin, 1993; Barkley, Cross, & Major, 2004; Pascarella & Terenzini, 1991; Springer, Donovan, & Stanne, 1998; Springer, Stanne, & Donovan, 1999; Vygotsky, 1978). Although it is reported that educators across disciplines and academic institutions are incorporating collaborative learning into curriculum (Barkley, Cross, & Major, 2004), Springer, Donovan, and Stanne (1999) observe that graduates still "go out into the workforce ill-prepared to solve real problems in a cooperative way, lacking the skills and motivation to continue learning" (p. 21).

Barkley, Cross, and Major (2004) describe three features that are essential to collaborative learning: intentional design, in which educators structure intentional learning activities for students; co-laboring, in which all participants in the group engage actively in working together toward stated objectives, contributing more or less equally; and meaningful learning, in which students work together on a collaborative assignment to increase their knowledge or deepen their understanding of course curriculum. Barkley, Cross, and Major further state, "having the classroom vibrate with lively, energetic small-group work is attractive, but it is educationally meaningless if students are not achieving intended instructional goals, goals shared by the teacher and students" (p. 5).

The Need for New Models of Instruction: The Importance of Social Relationships

Although the 19th century factory model of instruction remains firmly entrenched in schools, 80% of the employed population today does not engage in factory work (Winters, 1998). The shortcomings of large scale, factory-modeled schools have been well documented and studies reveal that "all else equal, students achieve at higher levels and feel more supported in smaller, communal school settings" (Darling-Hammond, 2003, p. ix). In an atmosphere of cooperation and mutual support, effective leadership teams can focus on student, teacher, and community needs and achievements; policy development; long range planning; and progress toward goals: "critical elements that together promote high achievement for all students" (Goodman & Zimmerman, 2000, p. 7).

Peer teaching has been enacted across teaching and learning contexts and grade levels with all age levels and learning contexts reporting benefits (Parr, Wilson, Godinho & Longaretti, 2004). Biggs (1999) reports positive results including enhanced motivation, improved cognitive and social outcomes in students' learning, and an advanced development of student responsibility for self-learning. Some researchers have reported that peer teaching has led to students' improved knowledge about the process of learning (Bruffee, 1999).

The Evolution of a Learning Community

The lead author has observed, participated in, and taught graduate programs designed to provide pre-service and in-service educators experience in creating multimedia technology curriculum (Stefl-Mabry, 2004). Disappointed to observe that, for the most part, many carefully constructed multimedia curriculum projects are set aside at the end of a college or university course without having been implemented or assessed for instructional effectiveness in real world settings, she was determined to transform the traditional model of teacher education. Intent upon improving the utilization of student and faculty productivity (e.g., time, talent, and energy), and with the approval of her department, she began to redesign a course (ISP523L, Fundamentals of Technology for School Libraries). The course is intended to provide graduate students majoring in School Library Media (SLM) the opportunity to learn the fundamentals of technology and connect them to K-12 professionals in order to collaborate, lead, and use technology reflectively to foster the growth of learning communities.

In the fall of 2002, she established a learning partnership with the Albany Public School District to establish a higher education/K-12 learning community based upon the following goals:

- To support high quality academic and clinical experiences for school library media specialists (SLMS) by providing intensive collaborative internship opportunities with neighboring schools.
- To identify and document best practices in school library media information literacy instruction through scientific inquiry, research, assessment, and reflection in authentic settings.
- To enable and encourage school media specialists, teachers, administrators, and

university faculty to become learning partners in the educational process.

- To lessen the digital divide by sharing the university's educational and technological resources with schools and surrounding communities.
- To create, implement, and rigorously evaluate high quality standards-based multimedia learning experiences based upon specific learning community needs.
- To define the role of the school library media specialist within a school setting as an information professional.
- To help all members within the learning community achieve and maintain information and media literacy. (Stefl-Mabry, 2004)

To realistically reflect the multiplicity of roles and multifaceted responsibilities of SLMS graduate students and to model a collaborative learning environment that SLMS will emulate when they began working professionally, ISP523L is not taught in the traditional college-based lecture style. Instead, weekly readings are assigned that highlight current selected literature from the fields of education, educational technology, cognitive psychology, and library and information science. Students form self-selected project teams (typically consisting of two to three members) and are encouraged to be collaborative participants and research partners. This model supports Harada (2003) and DuFour and Eaker's (1998) assertion that mutual cooperation, emotional support, and personal growth of social learning allows collaborative groups to achieve far more then they would accomplish if working on their own.

The Evolution of a Pedagogical Model

After the first pilot phase (2002-2003), it was determined that the technical components of the multimedia projects could be enhanced if the SLMS graduate students partnered with Information Science undergraduate students enrolled in a Web design course (ISP361). Phase II (2004-2005) introduced undergraduates into the learning partnership, which proved to be mutually beneficial for all learning cohorts (Stefl-Mabry & Goodall-Powers, 2005). The project teams expanded from two to three members to three to five members, with the addition of two undergraduate students. The undergraduates provided Web enhancement while the graduate students, as information professionals, provided standards-based information literacy content. Graduate students met regularly, on a weekly basis, with K-12 educators to

fulfill their certification field experience requirements. Each week they would relay design and usability requirements learned from the field, as well as theory garnered from their assigned readings, to their undergraduate partners. During the Spring 2005 semester, in an effort to facilitate communication among the learning partners, the K-12 in-service teachers were invited to attend a university class meeting with the full project team, including, for the first time, undergraduate design partners. This face-to-face meeting, scheduled during the regular class time proved to be tremendously helpful as it provided an opportunity for the university students to share preliminary conceptual models with their K-12 partners. The K-12 partners could also provide feedback and suggestions to strengthen the content, design, usability, and appropriateness of the projects. Graduate students and K-12 educators worked collaboratively on realistic formative and summative assessment strategies; once again, the curriculum projects collectively developed were implemented and assessed within the K-12 schools by the SLMS graduate students working in collaboration with the K-12 in-service professionals (teachers and school library media students).

At the end of the Spring 2005 semester, several of the K-12 teachers noted that it was unfortunate that the undergraduate students had not been able to observe the K-12 students using the completed Web projects during the implementation process. Thus, in the Fall 2005, Phase III was initiated and Stefl-Mabry and Doane increased the number of times K-12 in-service educators interacted with the project team to three class meetings over the course of the semester: the first in the beginning of the semester, the second at midterm, and the third during the last class meeting. The undergraduate students were also invited to observe K-12 students during the implementation phase in the K-12 setting to gather feedback from the K-12 students relative to the usability of the Web projects. The district and in-service educators were supportive of this decision, and several undergraduate students observed the implementation of their projects within the K-12 classroom and reported feeling "great" seeing the K-12 students actually using the Web projects.

The cooperation of the Albany Public School District has been remarkable, and it is important to note that the K-12 in-service teachers do not receive in-service credit for their participation. Still, they enthusiastically join the university class after school for three hours during the regularly scheduled ISP523L/361 class meeting. The district's educational technology consultants also attend the meetings and provide additional technological and

instructional expertise. This is tremendously beneficial as the educational technology consultants are familiar with the district's technology infrastructure and specific configurations. Sessions are productive and provide all participants the opportunity to share social and intellectual capital.

ISP523L & ISP361 Course Requirements

All ISP523L course requirements, with the exception of assigned biweekly individual reading reflections and peer evaluations, are designed to be collaborative. Each assignment throughout the semester builds upon the previous and culminates in the implementation, assessment, and final presentation of a New York State Education Department (NYSED), American Library Association (ALA), and the International Society for Technology & Education (ISTE) standards-based multimedia project for the K-12 audience, university faculty and staff, and greater community. The course is designed to help undergraduates understand the importance of designing Web software for a real audience, to help graduate students gain fluency in a wide range of K-12 technologies (including hardware and software), and to gain an understanding of students' information seeking behaviors. Ultimately, the goal is to enhance the learning outcomes for teachers, students, and faculty (K-12 and university). A long-term goal is to determine whether the pre-service graduate students will transfer the learning of reflective practice into their future in-service communities of practice. We are currently engaged in a research project to determine if this hypothesis is supported over time.

Students enrolled in ISP523L are expected to

- assess the informational needs of a "real" K-12 learning community with collaborative input from a school library media specialist and cooperating teacher.
- outline two or three plausible "solutions" to meet the informational and instructional needs of the targeted community.
- list NYSED, ALA, and ISTE information literacy standards and explain how the standards are addressed in the project.
- describe performance indicators addressed by the multimedia project and how such performance indicators are assessed.
- create formative and summative assessment instruments (surveys, questionnaires, rubrics, etc.) based upon appropriate standards and performance indicators.
- collaborate with school media specialist(s), teacher(s), and university faculty to determine the appropriate project for the community.
- identify project specific and appropriate informational resources (including traditional and non-traditional media) and instructional technology media (substantiated by peer-reviewed literature within the fields of library science, cognitive science, developmental psychology, and/or education technology).
- implement the project with the collaborative assistance of a certified school library media specialist and in-service teacher(s).
- administer, interpret, and evaluate multiple assessment measures designed to measure the effectiveness of the overall project in relation to student learning: Did the project do what it was supposed to do and how do you know that it did? In other words, clearly identify what is meant by learning*?* (Sarason, 2004).
- draft a formal report, written collaboratively by the project team, that outlines the origin and development of the project, substantiates each of the vital elements, analyzes and reflects upon the results, and suggests recommendations for modifications for future iterations of the project.
- share the results of the project in an oral collaborative presentation given by the graduate and undergraduates and shared with the greater learning community (K-12 and university). (Stefl-Mabry, 2004)

ISP361 students participate as Web development experts and are expected to exercise their understanding of usability, Web design, and technology. Undergraduate students collaborate with graduate students and K-12 in-service educators to develop a site plan, refine site content, and select an appropriate look and feel for the Web site. Undergraduate students then create a site design using Web standard technologies such as XHTML, Cascading Style Sheets, and JavaScript. The undergraduate course is designed to allow students to develop both project management skills and technical competency with respect to Web technologies; therefore, students enrolled in ISP361 are expected to

- produce Web pages with attention to content, design, usability, accessibility, audience, intellectual property issues, and professional presentation.
- effectively use current Web standards and technologies to create and maintain complex websites.
- understand which design elements support effective websites.

- develop communications and project management skills that allow them to contribute to a positive collaborative development experience.
- analyze end-user needs, design an appropriate solution, implement that solution, evaluate the success of the solution, and present the results of their work in both written and oral presentation.
- think critically and exercise writing and research skills through the original production of digital information.
- participate in an on-going collaborative development effort with ISP523L students and K-12 in-service educators.

This authentic experience of applying Web development skills in the context of the real world with real users makes this learning experience much more intense and valuable for all learners.

Peer-to-Peer-Teaching and Learning

During the Fall 2005 semester, 31 undergraduate students were enrolled in ISP361 and 12 students were enrolled in ISP523L. ISP523L students and ISP361 students met in their project teams during their regularly scheduled class time each week for approximately one hour to work on the curriculum projects collaboratively. Additionally, during the Fall 2005 semester, Doane introduced a Quality Assurance (QA) project team (Doane et al., 2006). This team, composed of 4 undergraduate students from ISP361, was tasked with interacting with all of the other project teams, observing team meetings, offering their input to the teams, and reporting on difficulties and accomplishments observed. The QA team served to share ideas and problem solutions among groups as well as providing an objective assessment of team progress.

Peer evaluation is a reflective practice activity to engage students in thinking about and responding to experiential phenomena. At the end of each class, all students are asked to complete an online peer evaluation of their performance whereby they evaluate and reflect upon their weekly group performance. Additionally, one person from each group evaluates the entire group. Weekly self- and peer- evaluations provide the faculty with an insider's view of the collaborative dynamic of the groups and an opportunity to intervene and/or mediate before tensions and anxiety escalate. This aligns with Parr, Wilson, Godinho, and Longaretti's recommendation for more investment into peer- and self-assessment in peer-teaching environments (2004).

One of the major goals of this professional collaboration between the two university faculty (their graduate and undergraduate students, in-service educators, and K-12 students) is to provide meaningful real world learning experiences designed to stimulate learners' thinking and learning. The instructor's role during this process is transformed from information transmitter to facilitator of knowledge sharing. Problem-based authentic learning partnerships permit K–12 districts to benefit from research-based best practices, while at the same time offering opportunities for graduate and undergraduate students to experience real-life career situations in an educational setting. Parr, Wilson, Godinho, and Longaretti's (2004) recommendations to improve the peer teaching process are equally important for a trans-generational learning model and are outlined briefly below:

- Clear communication of requirements for all participants,
- Clear organization of instructional content and class requirements,
- Effective teaching of collaborative and group skills,
- Time to reflect upon process,
- Peer and self assessment,
- Enhance student ownership and agency, and
- Interact with groups during the planning stages. (p. 200)

In addition we would strongly recommend that similar projects encompass the following:

- Regularly scheduled opportunities for all learning partners to meet face-to-face with fixed meeting dates arranged and agreed upon early in the semester (We use "learning contracts" with specific meeting dates listed that all parties sign during their first face-to-face full-team meeting).
- Encourage the groups to clearly articulate (in hard copy) and agree upon a shared vision of the design and content early in the semester.
- Provide consistent feedback throughout the semester (in person and via email) by university faculty to all learning partners to enhance student, learner, and teacher ownership and agency.
- Be sensitive to emergent group problems and proactively address such issues before they become stumbling blocks for a group's performance.

Learning in Context

Dewey proposed that schools should serve as an apprenticeship for civic life (Nieto, 2005) and recommended that schools develop actual ordinary life experiences into learning possibilities for learners: "Education through occupations consequently combines within itself more of the factors conducive to learning than any other method" (Dewey, 1916, p. 309). Dewey (1938) also stated, "Education, in order to accomplish its ends both for the individual learner and for society, must be based upon experience – which is always the actual life-experience of some individual" (p. 89). Thus, learning must be promoted in context, "not just through workshops but also through daily interactions in cultures designed for job-embedded learning" (Fullan, 2005, p. 69). If we are to change how we educate, there must be a concerted effort to build collaborative learning partnerships that extend from pre-K-12 to institutions of higher education. Although humans, by definition, are social beings, people will not "voluntarily" share knowledge "unless the dynamics of change favor exchange…put another way, turning information into knowledge is a social process, and for that you need to establish and build good relationships" (Fullan, 2001, p. 6).

The importance and value of a collaborative learning approach, particularly based on real world situations or problems, is well documented. Johnson and Johnson (1986) report that cooperative teams achieve at higher levels of thought and retain information longer than students who work individually. There is evidence that shared learning helps students become critical thinkers (Gokhale, 1995; Totten, Sills, Digby, & Russ, 1991). Vygotsky (1978) states that students work at higher cognitive levels when working collaboratively than when working individually, and Springer, Stanne, and Donovan (1999) observe that students who work in small groups perform better academically. Learning opportunities for students to develop collaborative skills that are embedded within graduate and undergraduate coursework provide a unique and important area to critically examine the effects of collaboration in an academic environment.

According to Huffman (2003), "Incorporating all dimensions of a professional community – shared leadership, shared vision, collective learning, supportive conditions, and shared personal practice – is important for student success and school improvement" (p. 32). This experiential trans-generational learning model enables teachers to be learners and students to be teachers. It enables learners "to develop both self-awareness and greater sensitivity to the transformational possibilities of [their] future organization (McGivern & Thompson, 2004, p. 145).

We argue that educators need to establish and sustain learning partnerships (Cronin, 2004) early in their professional careers. Understanding how to evaluate meaningful collaborative activities and assess their impact on educators and learners is an important area to study in order to create collaborative learning opportunities that promote cross-generational, educationally meaningful teamwork. We will be examining archival data collected during the Fall 2005 semester to further our understanding of collaborative learning and its implications for stakeholders. In the process, we hope to blur the boundaries between teaching and learning, and between teaching and research. By working together with in-service educators and their students as learning partners, university students and faculty, we hope to gain a better understanding of the social and professional reality of the K-12 learning environment.

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JOETTE STEFL-MABRY is an Associate Professor in the Department of Information Studies, College of Computing & Information, as well as an Associate Research Professor with the School of Education, at the University at Albany, State University of New York. She received a Ph.D. from Long Island University in Educational Technology and Information Studies. She earned her M.A. degree in psychology and education

from Ball State University and her B.A. degree in education from Hunter College, City University of New York. She conducts longitudinal research on the impact of technology on teaching and learning in education, and she explores ways to use technology to build bridges among faculty, departments, and the greater community.

WILLIAM E. J. DOANE recently completed his Ph.D. at the University at Albany. He received a B.A. degree in cognitive science from Hampshire College and an M.S. in information and computer sciences from the University of Hawaii. His research interests include developing innovative instructional methods in computing-related disciplines, the role of assessment and evaluation in education, and explicitly developing learners' mental models.

MICHAEL S. RADLICK is an independent research consultant working with schools and libraries through his not-for-profit organization—The Institute for Research on Learning Technology Visions, Inc. He served as the New York State Education Department's Director of Planning, Evaluation and Technology for over 15 years. He received his Ph.D. From Rensselaer Polytechnic Institute, his M.A. Degree from Wayne State University, and his B.A. degree from Sacred Heart College in Detroit, Michigan. His ongoing research focuses on the uses and impact of information and communication technology on the lives of young people.

PAMELA THÉROUX is an Assistant Professor in the Department of Educational Administration & Policy Studies, School of Education, University at Albany,

State University of New York as well as a Visiting Assistant Professor, School of Engineering, Rensselaer Polytechnic Institute, New York. She received a PhD *with Distinction* from Columbia University in Sociology, with Masters Degrees in Sociology and Education and International Educational Development from Columbia University Teachers College. As a sociologist, she specializes in research methodologies, particularly longitudinal research and mixed methods designs, and is interested in the concept of teaching-learning across youth domains, learning as a social process and the intersections among educating networks, particularly family, school and community connections. She can be contacted at ptheroux@albany.edu or theroux@rpi.edu